

ABSTRACT

Improvements to a method for imaging a target, which method including the steps of (a) transmitting ultrasonic energy at a fundamental frequency, (b) receiving reflected ultrasonic energy at a harmonic of the fundamental frequency and (c) generating an image responsive to reflected energy at the harmonic, are provided. The transmitting step includes transmitting a waveform with a positive pulse spatially defined by first and second zero values. A positive peak amplitude of the positive pulse is a first distance from the first zero value that is less than half a second distance between said first and second zero values. Thus, the waveform includes a fundamental spectral component and a harmonic spectral component at the transducer. An attenuation normalized peak of the harmonic spectral component is reduced at a region spaced from the transducer as compared to the peak at a region adjacent to the transducer. A negative peak is also shifted or pre-distorted. Various pre-distortions of the waveform may compensate for propagation, scattering, or system non-linearities.